

ABSTRACT

Disclosed is a method for correcting a nonlinearity error in a two-frequency laser interferometer which measures the phase angle using 90° phase mixing technique and a method for measuring a phase angle by using the same. The phase angle correcting method includes the steps of: calculating ellipse parameters, such as amplitudes, offsets and a phase difference of two sine and cosine output signals from the nonlinearity error correcting electronics; calculating an adjusting voltages for correcting offsets, amplitudes and a phase of the output signals; conducting a correction wherein offsets of output signals become zero, amplitudes are same, and a phase difference beyond 90° between the output signals becomes zero; and applying the output signals whose offsets, amplitudes and phase are corrected to Equation 15 ($\theta = \arctan(I_1'/I_2')$) to calculate the phase angle. Therefore, the present invention has an advantage of drastically improving accuracy in the displacement measurement using the two-frequency laser interferometer by correcting the offsets, the amplitudes, the phases, or the likes with respect to the output signals of the 90° phase mixer and thus eliminating the periodic nonlinearity error generated in the two-frequency laser interferometer.